

UNITED STATES DISTRICT COURT  
DISTRICT OF MASSACHUSETTS

HYDRO-PHOTON, INC.,  
Plaintiff,

v.

MERIDIAN DESIGN, INC.,  
Defendant.

C.A. No. 05-11240 GAO

**DEFENDANT MERIDIAN DESIGN, INC.’S STATEMENT OF  
MATERIAL FACTS IN SUPPORT OF ITS MOTION FOR  
SUMMARY JUDGMENT OF NON-INFRINGEMENT**

Pursuant to Federal Rule of Civil Procedure 56 and Local Rule 56.1, Defendant Meridian Design, Inc. (“Meridian”), respectfully submits its statement of material facts as to which there is no genuine issue to be tried in support of its Motion for Summary Judgment of Non-Infringement. Plaintiff Hydro-Photon, Inc. (“Hydro-Photon”) does not have sufficient evidence to support its claim of patent infringement. Accordingly, there is no genuine issue of material fact, and Meridian is entitled to judgment as a matter of law on the Plaintiff’s Complaint.

**I. FORMAT AND CONTENT**

The statements of fact set forth herein shall be referred to below and in Meridian’s accompanying Memorandum as “Fact” followed by a paragraph number (i.e., “Fact 1”). The evidence of record in support of each Fact is the Declaration of Dan Matthews and the exhibits attached hereto.

## II. UNDISPUTED FACTS

### Hydro-Photon's Patent and Infringement Claim

1. In its Complaint, Hydro-Photon accuses Meridian of infringing U.S. Patent No. 6,110,424 (“the ‘424 patent”) by making, using, offering for sale and/or selling its AquaStar™ product. Complaint ¶ 11.

2. The ‘424 patent describes and claims a system for purifying water using ultraviolet light emitted from a hand-held device. Ex. 1 (the ‘424 patent).

3. The ‘424 patent discloses a portable ultraviolet water purification system. Ultraviolet light in the “germicidal range” emitted from an ultraviolet lamp is intended “to disinfect water, that is, to rid water of bacteria, viruses, algae and so forth.” *Id.*, col. 1, lines 13-16; *id.*, col. 2, lines 28-30.

4. As described in the specification of the patent, Hydro-Photon's claimed device includes an “ultraviolet [UV] lamp [12] that is enclosed in a quartz cover [16] and is powered by a battery and associated ballast circuitry. The battery and ballast circuitry are connected to the lamp by switches that are under the *control* of a liquid-level sensor. The sensor connects the battery, the ballast circuitry and the lamp once the sensor determines that the ultraviolet lamp is fully immersed in the water.” *Id.*, Abstract (emphasis added).

5. The device claimed in the ‘424 patent includes an ultraviolet transmissive cover. As the specification describes, “[a] quartz sleeve surrounds the UV light source, to protect it and its electrical connections from the water while allowing the UV radiation to pass to the water.” *Id.* 1, col. 1, lines 19-22; *id.*, col. 2, lines 33-34.

6. The ‘424 patent is concerned with potential harmful ultraviolet radiation exposure to the user. It proposes protecting the user from ultraviolet radiation by the use of the liquid-level sensor, as follows (*id.*, col. 2, lines 5-11):

The system, which is battery-operated, further includes a liquid-level sensor at the base of the UV lamp. The sensor prevents the lamp from turning on until the lamp is fully immersed in the water. The container and the water act to shield the UV radiation, such that little is emitted from the container. This prevents potentially harmful UV radiation from reaching the user and, in particular, the user’s eyes.

*See id.*, col. 2, lines 44-53; *see also id.*, col. 2 lines 56-59 (“When the sensor determines that it is in water, which necessarily means that the lamp is immersed in the water, the sensor closes the switches and **allows** the lamp to be turned on.”) (emphasis added).

7. The specification of the ‘424 patent discloses only one embodiment of the invention, as follows (*id.*, col. 3, lines 8-12) (emphasis added):

As discussed above, the lighting of the lamp 12 is **ultimately controlled** by the liquid-level sensor 20, such that the lamp lights only when both the on-off switch 29 is in the on position and the lamp is fully immersed in water.

*See also id.*, col. 3, lines 23-27 (“When the liquid-level sensor 20 determines that the lamp is fully immersed in the water, the sensor closes the switches (not shown) that separate the ballast circuitry 13 and the battery 14 (FIG. 1) from the lamp 12, and the lamp then turns on.”).

8. The specification includes no description or suggestion of any alternative embodiment of the invention in which the light source is controlled solely by an on-off switch, or by any structure other than the combination of a liquid-level sensor and an on-off switch. *Id.*

9. Hydro-Photon has alleged that Meridian is infringing claims 7-10 of the ‘424 patent, of which only claim 7 is in independent form. Ex. 2.

10. All of claims 7-10 require a “control means for turning the light source on and off,” which is a limitation in independent claim 7. Ex. 1, col. 4, lines 26-38.

Meridian's Accused Product

11. Meridian manufactures and sells an ultraviolet portable water purifier product called AquaStar™. Matthews Dec. ¶ 2.

12. Meridian also manufactures and sells a product called AquaStar Plus!™, which includes the same features as the AquaStar™ and certain additional features, such as an improved timing circuit, better weather sealing, added shock protection, and a built-in camping lantern function. *Id.* ¶¶ 2, 4.

13. The AquaStar™ product includes a bottle with an opening and threaded screw-on cap that fits over the opening of the bottle. The cap includes an ultraviolet bulb mounted to the cap and oriented to extend into the bottle when the cap is screwed onto the bottle. The cap contains batteries for providing power to the ultraviolet bulb and a switch for the turning the bulb on and off. *Id.* ¶ 3.

14. The AquaStar™ product does not have a liquid-level sensor that controls whether the ultraviolet bulb will turn on. *Id.* ¶ 5.

15. The AquaStar™ product does not include anything equivalent to the combination of a liquid-level sensor and an on-off switch. *Id.* ¶ 6.

16. The user can press the switch on the cover of the AquaStar™ product to turn the bulb on while the bulb is *not* immersed in water. *Id.* ¶ 7.

17. The AquaStar™ product is designed to operate even when the bulb is not immersed in water because the bottle, which is made of a polycarbonate material, blocks 100% of the ultraviolet light emitted by the ultraviolet bulb regardless of whether the ultraviolet bulb is immersed in water. However, since the ultraviolet bulb of the AquaStar™ product will operate

even when the bulb is not immersed in water, users are cautioned not to press the on-off switch when the bulb is not inserted into the bottle filled with water. *Id.* ¶ 8.

Prosecution of the ‘424 Patent in the U.S. Patent and Trademark Office

18. In an Office Action dated April 14, 1999, and issued by the U.S. Patent and Trademark Office in connection with the application which issued as the ‘424 patent, the patent examiner stated that several claims were allowable as distinguishable from one of the cited prior art references, U.S. Patent No. 4,276,256 issued to Karamanian, because the claims included a liquid-level sensor, as follows:

The following is a statement of reasons for the indication of allowable subject matter: Although Karmanian teaches purifying water with a hand-held UV lamp, there is no suggestion to include a liquid-level sensor that prevents the lamp from turning on until the lamp is immersed in water.

Ex. 3, page 4, ¶8.

19. During proceedings in the Patent & Trademark Office, Hydro-Photon narrowed the claims with the additional limitation of a “control means for turning the light source on and off.” In an Office Action dated August 3, 1999, the patent examiner rejected application claim 11 (which issued as claim 7) under 35 U.S.C. § 103(a) as being unpatentable over the Karamanian reference. Ex. 4, page 2, ¶2.

20. In response to this rejection, in an Amendment dated November 18, 1999, the patentee acquiesced to the rejection and amended the claim with a narrowing amendment by adding the limitation of “control means for turning the light source on and off.” The patentee

also added a new claim (application claim 25, which issued as claim 24), including this same limitation. Ex. 5, pages 3 and 6 (application claims 11 and 25).

Dated: November 14, 2005

Respectfully submitted,

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US006110424A

**United States Patent** [19][11] **Patent Number:** **6,110,424****Maiden et al.**[45] **Date of Patent:** **\*Aug. 29, 2000**[54] **HAND-HELD ULTRAVIOLET WATER PURIFICATION SYSTEM**[75] Inventors: **Miles Maiden; Robert Watkins**, both of Blue Hill, Me.[73] Assignee: **Hydro-Photon, Inc.**, Blue Hill, Me.

[\*] Notice: This patent is subject to a terminal disclaimer.

[21] Appl. No.: **09/256,054**[22] Filed: **Feb. 23, 1999****Related U.S. Application Data**

[63] Continuation of application No. 08/790,750, Jan. 1, 1997, Pat. No. 5,900,212.

[51] Int. Cl.<sup>7</sup> ..... **C02F 1/32**[52] U.S. Cl. .... **422/24; 250/432 R; 250/504 H; 210/748**[58] Field of Search ..... **422/24; 250/432 R, 250/433, 455.11, 504 H; 210/748, 241**[56] **References Cited****U.S. PATENT DOCUMENTS**

1,896,365 2/1933 Harding ..... 422/24 X

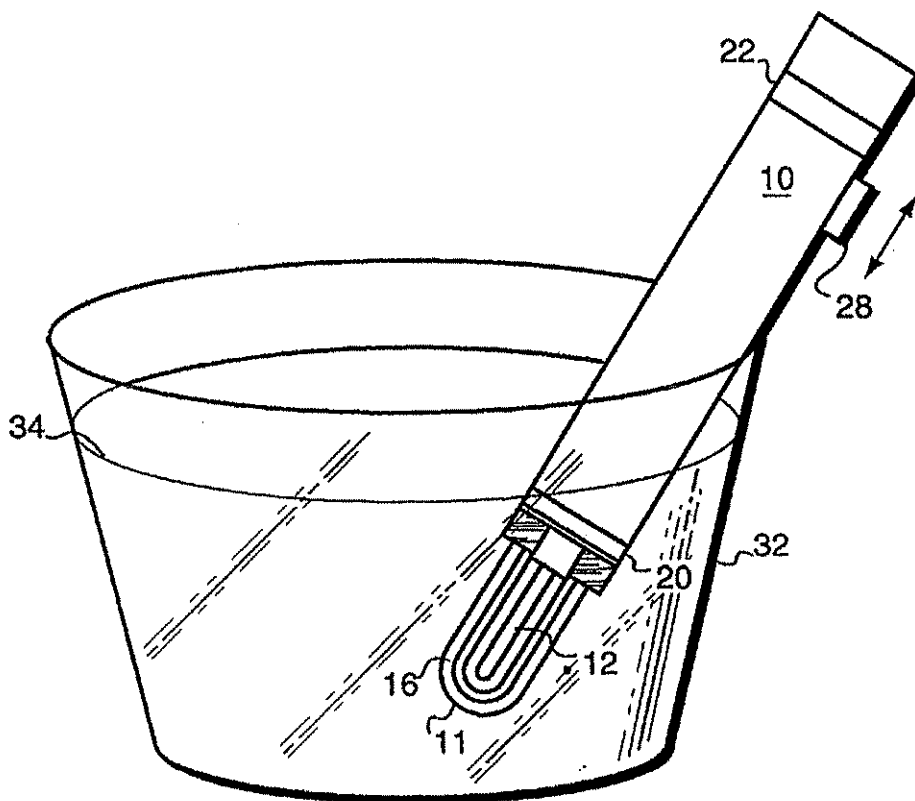
|           |         |               |       |           |
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| 1,965,947 | 7/1934  | Prouty        | ..... | 422/24 X  |
| 3,843,521 | 10/1974 | Zeff          | ..... | 422/24 X  |
| 4,276,256 | 6/1981  | Karamian      | ..... | 422/24    |
| 4,762,613 | 8/1988  | Snowball      | ..... | 422/24 X  |
| 5,173,269 | 12/1992 | Mon et al.    | ..... | 422/186.3 |
| 5,900,212 | 5/1999  | Maiden et al. | ..... | 422/24    |

**FOREIGN PATENT DOCUMENTS**

|          |         |                |   |
|----------|---------|----------------|---|
| 8-117742 | 5/1996  | Japan          | . |
| 2301272  | 11/1996 | United Kingdom | . |

*Primary Examiner*—Elizabeth McKane*Attorney, Agent, or Firm*—Cesari and McKenna, LLP[57] **ABSTRACT**

A hand-held water purification system includes a pen-light sized ultraviolet lamp that is enclosed in a quartz cover and is powered by a battery and associated ballast circuitry. The battery and ballast circuitry are connected to the lamp by switches that are under the control of a liquid-level sensor. The sensor connects the battery, the ballast circuitry and the lamp once the sensor determines that the ultraviolet lamp is fully immersed in the water. If the container that holds the water is relatively large, the lamp and quartz cover end of the system are used to stir the water, to ensure that all of the water comes sufficiently close to the ultraviolet lamp.

**27 Claims, 2 Drawing Sheets**

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Sheet 1 of 2

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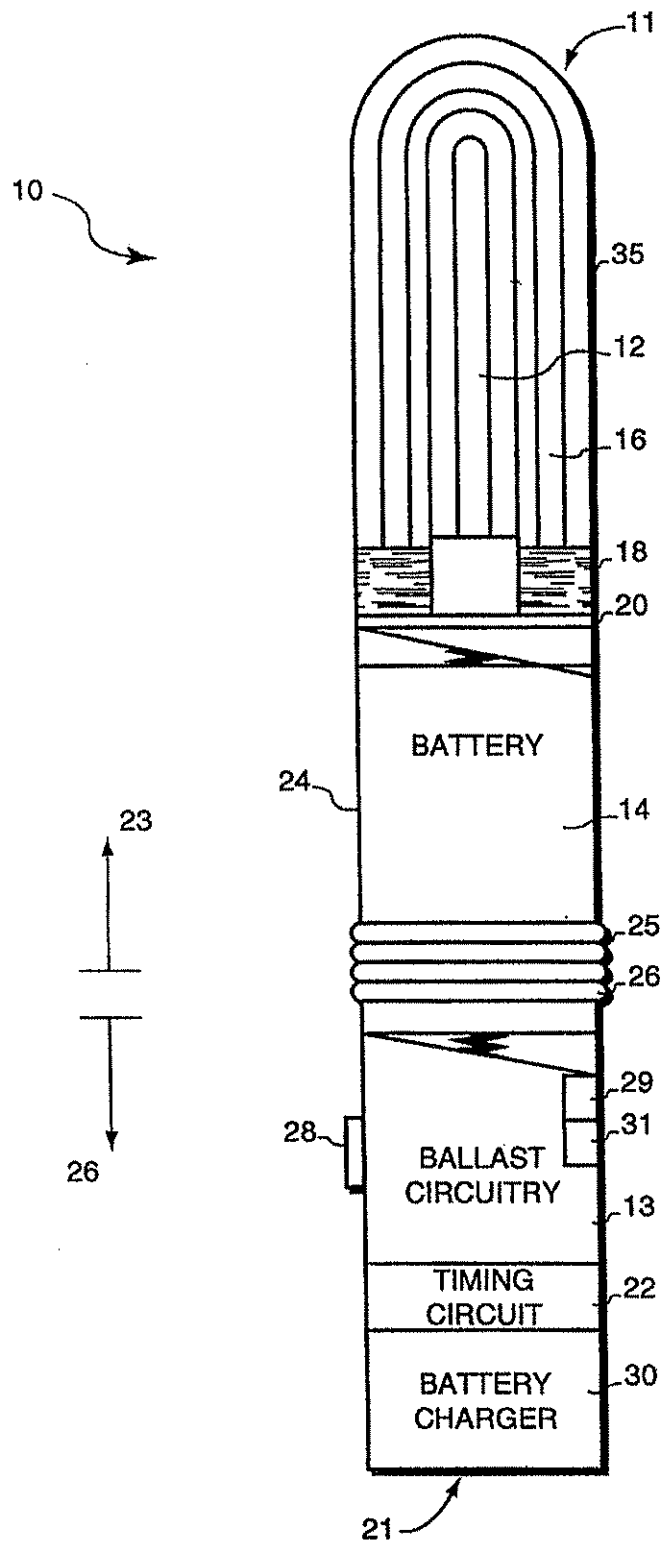


FIG. 1

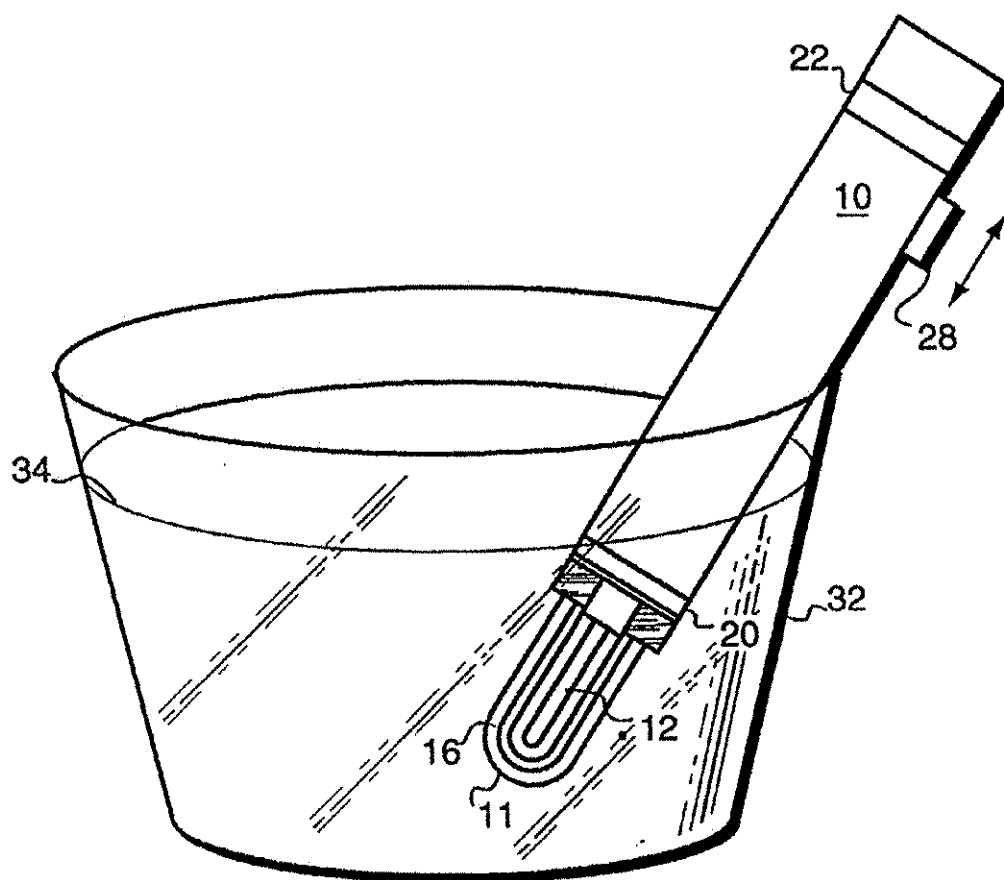


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**FIG. 2**

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## HAND-HELD ULTRAVIOLET WATER PURIFICATION SYSTEM

This application is a continuation of Ser. No. 08/790,750, filed Jan. 1, 1997, now U.S. Pat. No. 5,900,212.

### FIELD OF THE INVENTION

The invention relates to systems for disinfecting water using ultraviolet light.

### BACKGROUND OF THE INVENTION

It is known that ultraviolet ("UV") light in the germicidal range, of approximately 254 nm, can be used to disinfect water, that is, to rid water of bacteria, viruses, algae and so forth. Known prior water purification systems that use UV light are large, installed systems that each include a flow-through subsystem, which causes water to travel past an elongated UV light source that is suspended therein. A quartz sleeve surrounds the UV light source, to protect it and its electrical connections from the water while allowing the UV radiation to pass to the water. Such systems are currently used to purify water for use in, for example, hospitals or schools.

The flow-through subsystems each essentially include a flow-through chamber, i.e., a pipe. As water flows through the pipe, it travels past the quartz sleeve, and thus, the UV light source, and is exposed to UV radiation. The UV radiation kills the bacteria, viruses and so forth that are present in the water. Waste byproducts may build up on the quartz sleeve, and accordingly, the systems include wiper mechanisms that periodically clean the quartz sleeves. These systems typically include a mechanism, such as a viewing port and/or a sensor, for determining the output level of the lamp. A user can visually check the lamp through the view port to ensure both that the lamp is turned on and that the quartz sleeve is sufficiently clean to pass the level of UV radiation required to disinfect the water. The sensor measures the UV radiation for the same purpose,

These flow-through systems work well for disinfecting relatively large quantities of water. They are not, however, suitable for disinfecting small quantities of water.

Today campers, hikers, travelers and the like encounter bacteria and virus infected water in streams, lakes and rivers, and in some countries even in the local plumbing. These hikers, campers and travelers must thus either carry bottled water with them or use portable filtering systems and/or chlorine, hydrogen peroxide or iodine tablets, to disinfect the water. The filtering systems are generally bulky, and thus, inconvenient to carry. Further, while they may remove bacteria and algae from the water, they do not remove viruses, which are typically too small to be caught in the filters. The chemical tablets are certainly portable but they are relatively expensive. Further, the tablets change the taste and smell of the water and add undesirable chemical byproducts to the water. Indeed, the tablet manufacturers generally warn against continuous use of the tablets, for health reasons.

### SUMMARY OF THE INVENTION

The invention is a portable, hand-held water purifier that uses UV light to disinfect small quantities, or batches, of water. The water purifier, which is approximately the size and shape of a pen light, has extending from one end a small UV lamp with a quartz cover. The cover, and thus, the lamp, are dipped into a container of water and the lamp is then

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turned on, to rid the water of infectious agents. As necessary, the user may use the lamp end of the system to agitate the water, to ensure that all of the water passes sufficiently close to the lamp.

The system, which is battery-operated, further includes a liquid-level sensor at the base of the UV lamp. The sensor prevents the lamp from turning on until the lamp is fully immersed in the water. The container and the water act to shield the UV radiation, such that very little is emitted from the container. This prevents potentially harmful UV radiation from reaching the user and, in particular, the user's eyes.

### BRIEF DESCRIPTION OF THE DRAWINGS

The above and further advantages of the invention may be better understood by referring to the following description in conjunction with is the accompanying drawings, in which:

FIG. 1 is a cut away side view of a portable water purification system constructed in accordance with the invention; and

FIG. 2 illustrates the portable water purification system of FIG. 1 in use.

### DETAILED DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS

FIG. 1 illustrates a portable, hand-held water purification system 10 for disinfecting water in relatively small batches. The system includes, extending from a first end 11, a pen-light sized quartz UV lamp 12 that emits light in the germicidal range. In the exemplary system, the lamp 12 emits light at 254 nm. The lamp is powered through ballast circuitry 13 by a battery 14, which in the exemplary system is a size AA, 3.4 volt rechargeable lithium battery. A quartz cover 16 surrounds the UV lamp 12 on three sides. The quartz cover 16 fits into a holder 18 that also acts as a shock absorber for the lamp 12. The holder 18 thus compresses and bends, as appropriate, should the cover 16, and thus, the lamp 12, bump an edge or side of a container 32 (FIG. 2) into which they are placed. In the exemplary system the holder 18 is made of silicon and forms a watertight seal with the cover 16, to prevent water from reaching the lamp and the associated circuitry. A removable protective cover 35 protects the lamp and quartz cover when the device is not in use.

A liquid-level sensor 20, which is connected to switches (not shown) between the lamp 12, and the ballast circuitry 13 and battery 14, prevents the UV lamp from turning on until it is fully immersed in water. The UV radiation from the lamp is then absorbed and/or reflected by the water and the container such that very little of the UV radiation escapes from the container. The user, who is holding the other end 21 of the system, is thus protected from harmful levels of the UV radiation, which might otherwise adversely affect his or her eyes.

The sensor 20 may, for example, be a capacitive-type sensor that senses the difference in capacitance of the water and the surrounding air. When the sensor determines that it is in water, which necessarily means that the lamp is immersed in the water, the sensor closes the switches and allows the lamp to be turned on.

The water purifier 10 may also include a timing circuit 22 connected between the sensor and the lamp and associated circuitry. The timing circuit turns the lamp off a predetermined time, for example, 15 seconds, after the sensor 20 turns the lamp on.

The battery 14 and related circuitry are encased in a water-resistant tube 24. In the exemplary embodiment, the

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tube 24 is constructed of stainless steel. The entire water purifier is approximately six and three-quarters inches long and five-eighths of an inch in diameter, and fits comfortably in one hand. The tube 24 includes two parts, namely, a top 23 and a bottom 26, that screw together at a joint 25, so that the battery 14 can be replaced, as necessary. A silicon O-ring 26 makes the joint 25 water-tight.

The user controls the system with an on-off switch 28. As discussed above, the lighting of the lamp 12 is ultimately controlled by the liquid-level sensor 20, such that the lamp lights only when both the on-off switch 28 is in the on position and the lamp is fully immersed in water.

The water purifier 10 may also include a battery charger 30, which in the exemplary system is a conventional inductive-type charging circuit. Further, the purifier may include a power-on LED 29 and a low-battery LED 31, which indicate to a user, respectively, that the UV lamp is lit and that the battery needs replacing or recharging.

Referring now to FIG. 2, a user places the lamp end 11 of the water purifier 10 in water 34 that is, in the example, contained in a drinking glass 32. The user turns the system 10 on by moving the on-off switch 28 to the appropriate position. When the liquid-level sensor 20 determines that the lamp is fully immersed in the water, the sensor closes the switches (not shown) that separate the ballast circuitry 13 and the battery 14 (FIG. 1) from the lamp 12, and the lamp then turns on. The sensor 20 also starts the timing circuit 22 that keeps the lamp lit for a predetermined time.

The user may use the lamp end 11 of the system 10 to stir the water 34, to ensure that all of the water comes sufficiently close to the source of the UV radiation. If the container is small, however, the user need not stir the water.

After use, the user may wipe or wash the quartz sleeve 16, to clear away any waste byproducts that may have adhered to the sleeve and may adversely affect the output level of the device. Accordingly, the hand held purifier need not include a complex wiping mechanism and associated radiation-level sensor, as is required in the prior flow-through systems.

The hand-held UV water purification system 10 is thus a fully portable system that disinfects relatively small quantities, or batches, of water, such as the water contained in a drinking glass. The water purifier 10 is small and light weight so that it is easily and conveniently used when traveling, hiking, camping and so forth. This is in contrast to known flow-through UV water purification systems that are designed to disinfect large quantities of water for schools, hospitals and so forth. Such flow-through systems are installed such that water is piped past an elongated UV light source that is permanently suspended in the piping. These flow-through systems do not work with the small quantities of water with which the hand-held portable system is expected to be used, and are not conveniently portable.

The foregoing description has been limited to a specific embodiment of this invention. It will be apparent, however, that variations and modifications may be made to the invention, with the attainment of some or all of its advantages. Therefore, it is the object of the appended claims to cover all such variations and modifications as come within the true spirit and scope of the invention.

What is claimed is:

1. A method of purifying a batch of unsterilized water that is held in a container, the method including the steps of:

- A. immersing an ultraviolet light source and associated ultraviolet transmissive cover that extend from a first end of the system in the batch of unsterilized water;
- B. sensing that the light source is immersed fully in the unsterilized water;

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C. turning the light source on to emit ultraviolet radiation in the batch of unsterilized water in the container, the radiation purifying the water.

2. The method of claim 1 further including the step of agitating the water by stirring the water with the first end of the system.

3. The method of claim 1 further including the step of turning the light source off a predetermined time after the light source is turned on.

4. A method of purifying water that is held in a container, the method including the steps of:

- A. immersing an ultraviolet light source and an associated ultraviolet transmissive cover that form one end of a water purification system in the water to be purified;
- B. turning the light source on to emit ultraviolet radiation in the water; and
- C. agitating the water by stirring the water with the light source and cover end of the system, the radiation from the light source purifying the water.

5. The method of claim 4 further including the step of sensing that the light source is immersed fully in the water before turning on the light source.

6. The method of claim 4 further including the step of turning the light source off a predetermined time after the light source is turned on.

7. A hand-held system for purifying unsterilized water, the system including:

- A. a drinking container having at one end an opening through which water both enters and exits the container and a second closed end for holding the water in the container;
- B. a case with an outwardly extending ultraviolet light source, the light source for submerging in the unsterilized water that is held in the drinking container and providing ultraviolet emissions that purify the unsterilized water;
- C. control means for turning the light source on and off, the control means being contained in the case.

8. The system of claim 7 further including a liquid-level sensor that prevents the light source from turning on until the light source is immersed in water.

9. The system of claim 8 further including a timing circuit that turns the light source off a predetermined time after the sensor allows the light source to turn on.

10. The system of claim 8 wherein the means for turning on the light source includes a battery.

11. The system of claim 10 wherein the battery is rechargeable and the system further includes a battery charger.

12. A method of purifying water that is held in a container, the method including the steps of:

- A. immersing an ultraviolet light source and an associated ultraviolet transmissive cover that form one end of a water purification system in the water to be purified;
- B. turning the light source on to emit ultraviolet radiation in the water to purify the water; and
- C. agitating the water to expose all of the water in the container to the ultraviolet radiation.

13. The method of claim 12 further including the step of sensing that the light source is immersed fully in the water before turning on the light source.

14. The method of claim 12 further including the step of turning the light source off a predetermined time after the light source is turned on.

15. The method of claim 12 wherein the step of agitating the water includes agitating the water with the immersed ultraviolet light source.

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16. A hand-held water purification system for purifying unsterilized water in batches, the system including:

- A. an ultraviolet light source;
- B. an ultraviolet transmissive cover that fits over the light source;
- C. power means for supplying power to the light source; and
- D. a case that contains the power means and connects to the ultraviolet transmissive cover to form a water-tight enclosure for the ultraviolet light and the power means.

17. The system of claim 16 further including a liquid-level sensor that prevents the light source from turning on until the light source is immersed in water.

18. The system of claim 17 further including a timing circuit that turns the light source off a predetermined time after the sensor turns the light source on.

19. The system of claim 17 wherein:

- a. the battery is rechargeable; and
- b. the system further includes a battery charger.

20. The system of claim 16 wherein the power means includes a battery and an associated ballast circuit.

21. The system of claim 16 wherein the case includes
- a. a first section and a second section that separate to provide access to the power means, and
  - b. sealing means for making a water-tight seal between the first and second sections.

22. The system of claim 21 wherein the sealing means is a gasket.

23. The system of claim 16 further including in the case a control means for switching the ultraviolet light source on to purify a batch of unsterilized water and thereafter switching the light source off.

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24. A hand-held system for purifying unsterilized water, the system including:

- A. a case with an outwardly extending ultraviolet light source, the light source for submerging in the unsterilized water and providing ultraviolet emissions that purify the unsterilized water,
- B. control means for turning the light source on and off, the control means being contained in the case.
- C. an ultraviolet transmissive cover that fits over the ultraviolet lamp and connects to the case in a water-tight manner to protect the lamp and the control means from the water.

25. The system of claim 24 wherein the control means includes

- a. a switch; and
- b. a timer for operating the switch to turn the light source off a predetermined time after the light source turns on.

26. A method of purifying a batch of unsterilized water that is held in a container, the method including the steps of:

- A. immersing an ultraviolet light source and an associated ultraviolet transmissive cover that form one end of a water purification system in the batch of unsterilized water that is held in the container;
- B. turning the light source on to emit ultraviolet radiation in the batch of unsterilized water in order to sterilize the water;
- C. turning the light source off; and
- D. removing the light source from the batch of water held in the container.

27. The method of claim 26 wherein the step of turning the light source off further includes turning the light source off a predetermined time after turning the light source on.

\* \* \* \* \*

**From:** Thomas O'Konski [mailto:tok@c-m.com]  
**Sent:** Monday, October 31, 2005 2:37 PM  
**To:** Peter Midgley  
**Cc:** John L. Capone; Kevin Gannon  
**Subject:** Asserted Claims

Peter:

As presently advised, Hydro-Photon, Inc. believes that the Meridian Design, Inc. Aquastar product infringes at least claim 7 of the '424 patent, and that its Aquastar Plus product infringes at least claims 7 through 10 of the '424 patent. We, of course, reserve our right to modify or expand our infringement contentions as discovery dictates.

In accordance with our agreement, we will plan on exchanging a list of the terms in these claims that are likely to be disputed, our proposed constructions for these terms, and the bases for the constructions, on Friday, November 4, 2005.

We will contact you on Friday to discuss the logistics of the exchange.

Tom O'Konski

11/09/2005

*Handwritten:* 11/4/99



UNITED STATES DEPARTMENT OF COMMERCE  
 PATENT AND TRADEMARK OFFICE  
 ADDRESS: COMMISSIONER OF PATENTS AND TRADEMARKS  
 WASHINGTON, D.C. 20530

|                 |          |                     |       |              |
|-----------------|----------|---------------------|-------|--------------|
| APPLICATION NO. | DATE     | REGISTERED INVENTOR | CLASS | OFFICE       |
| 097256, USA     | 02/20/99 | MAIDEN              | M     | 105030-00010 |

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|           |  |
|-----------|--|
| EXAMINER  |  |
| MCKANE, E |  |

|          |              |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

1744  
 DATE MAILED: 04/14/99

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks



|                       |                               |                              |
|-----------------------|-------------------------------|------------------------------|
| Office Action Summary | Application No.<br>09/256,054 | Applicant(s)<br>MAIDEN et al |
|                       | Examiner<br>Leigh McKane      | Group Art Unit<br>1744       |

☐ Responsive to communication(s) filed on \_\_\_\_\_

☐ This action is FINAL.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

**Disposition of Claims**

☒ Claim(s) 1-10 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-10 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

**Application Papers**

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. § 119**

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

**Attachment(s)**

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

Application/Control Number: 09/256054

Page 2

Art Unit: 1744

*Double Patenting*

1. Claim 10 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 7. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim 10 has been further treated as if it depends from claim 8. Correction is required.

*Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.



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Art Unit: 1744

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1, 5, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Karamian.

Karamian teaches a water purification system including a case that supports the system (not labeled but is the top section of the UV wand 13) having a first end and a second end, a UV lamp 13 extending from the first end of the case, a quartz cover fitted over the lamp (col.2, lines 60-63). In use the quartz cover is submerged in the water within container 12 (Figure 3) and the lamp is turned on intermittently to purify the water. See col.3, lines 12-13. Although not disclosed, from the figures, it appears that the UV lamp is powered by a source through a power cord. However, one of ordinary skill in the art would have found it obvious to use a known source of electrical power, such as a battery and its associated power supply means. It is clear from the small size of the device of Karamian and the disclosure that it is easily removed, that the UV lamp can be hand-held. <sup>see col.3, lines 19-20.</sup> With respect to sensing that the lamp is immersed, this can be done by "sensing" it by simply seeing the lamp.

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6. Claims 6 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Karamian in view of Mon et al.

Karamian does not teach stirring the water with the end of the lamp. Mon et al discloses a hand-held UV wand that may be placed within a container of liquid and moved so as to stir the liquid. Mon et al teaches that movement of the wand within the liquid assures contact between the UV radiation and all of the liquid within the container. See col.5, lines 61-64. This logic applies to the method of Karamian, as well. Thus, it would have been obvious to one of ordinary skill in the art to stir with the lamp of Karamian in order to assure contact between the UV radiation and all of the water within the container.

*Allowable Subject Matter*

7. Claims 2-4 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter: Although Karamian teaches purifying water with a hand-held UV lamp, there is no suggestion to include a liquid-level sensor that prevents the lamp from turning on until the lamp is immersed in water.

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Art Unit 1744

*Conclusion*

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Snowball teaches UV purification of water. Harding discloses a UV wand 31 for treating water. Prouty discloses a hand-held UV wand that may radiate at germicidal wavelengths. Holt teaches a hand-held germicidal lamp.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leigh McKane, whose telephone number is (703) 305-3387. The examiner can normally be reached on Monday-Thursday from 7:30 AM-5:00 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Robert Warden, can be reached at (703) 308-2920. The Unofficial fax phone number for this Group is (703) 305-7719. The Official fax phone number for this Group is (703) 305-3599.

When filing a FAX in Technology Center 1700, please indicate in the Header (upper right) "Official" for papers that are to be entered into the file, and "Unofficial" for draft documents and other communications with the PTO that are not for entry into the file of the application. This will expedite processing of your papers.

Communications via Internet e-mail regarding this application, other than those under 35 U.S.C. 132 or which otherwise require a signature, may be used by the applicant and should be addressed to [robert.warden@uspto.gov]. All Internet e-mail communications will be made of

Application/Control Number: 09/256054

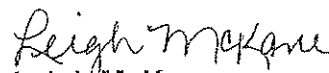
Page 6

Art Unit: 1744

record in the application file. PTO employees will not communicate with applicant via Internet e-mail where sensitive data will be exchanged or where there exists a possibility that sensitive data could be identified unless there is of record an express waiver of the confidentiality requirements under 35 U.S.C. 122 by the applicant. See the Interim Internet Usage Policy published by the Patent and Trademark Office Official Gazette on February 25, 1997 at 1195 OG 89.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist, whose telephone number is (703) 308-0661.

April 12, 1999

  
Leigh McKane  
Primary Examiner  
Art Unit 1744

PAGE 1 OF 1

|  |   |  |                        |                              |                           |                            |                |
|--|---|--|------------------------|------------------------------|---------------------------|----------------------------|----------------|
| FORM PTO-892   |   | U.S. DEPARTMENT OF COMMERCE<br>PATENT AND TRADEMARK OFFICE |                        | SERIAL NO.<br>09/256054      | GROUP ART<br>UNIT<br>1744 | ATTACHMENT<br>TO PAPER NO. | 2              |
| NOTICE OF REFERENCES CITED   |   |  |                        | APPLICANT(S)<br>MAIDEN et al |                           |                            |                |
| U.S. PATENT DOCUMENTS  |   |  |                        |                              |                           |                            |                |
| *  |   | DOCUMENT NO.   | DATE                   | NAME                         | CLASS                     | SUB-<br>CLASS              | FILING<br>DATE |
|  | A | 1,896,365  | 2/1933                 | Harding                      | 422                       | 24 XR                      |                |
|  | B | 1,965,947  | 7/1934                 | Prouty                       | 422                       | 24 XR                      |                |
|  | C | 4,276,256  | 6/1981                 | Karamian                     | 422                       | 24                         |                |
|  | D | 4,762,613  | 8/1988                 | Snowball                     | 422                       | 24 XR                      |                |
|  | E | 5,173,269  | 12/1992                | Mon et al.                   | 422                       | 186.3                      |                |
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| FOREIGN PATENT DOCUMENTS   |   |  |                        |                              |                           |                            |                |
| *  |   | DOCUMENT NO.   | DATE                   | COUNTRY                      | NAME                      | CLASS                      | SUB-<br>CLASS  |
|  | L | 2,301,272  | 11/1996                | GB                           | HOLT                      | —                          | —              |
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| OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, Etc.)  |   |  |                        |                              |                           |                            |                |
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| EXAMINER<br>Leigh McKane   |   |  | DATE<br>April 12, 1999 |                              | Form 892ccs2106b          |                            |                |
| * A copy of this reference is not being furnished with this office action.<br>(See Manual of Patent Examining Procedure, section 707.05(a).) |   |  |                        |                              |                           |                            |                |



UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

|                 |             |                      |                     |
|-----------------|-------------|----------------------|---------------------|
| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
|-----------------|-------------|----------------------|---------------------|

09/256,054 02/23/99 MAIDEN

M 108030-00010

IM22/0803

EXAMINER

PATRICIA A SHEEHAN  
CESARI & ROWES  
30 ROWES WHARF  
BOSTON MA 02110

MCKANE, E

ART UNIT

PAPER NUMBER

1744

DATE MAILED:

08/03/99

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

|                       |                               |                              |
|-----------------------|-------------------------------|------------------------------|
| Office Action Summary | Application No.<br>09/256,054 | Applicant(s)<br>MAIDEN et al |
|                       | Examiner<br>Leigh McKane      | Group Art Unit<br>1744       |

☒ Responsive to communication(s) filed on Jun 23, 1999

☐ This action is FINAL.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

**Disposition of Claims**

☒ Claim(s) 1-19 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-13, 16, and 18 is/are rejected.

☒ Claim(s) 14, 15, 17, and 19 is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

**Application Papers**

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. § 119**

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

**Attachment(s)**

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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*Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Karamian.

Karamian teaches a water purification system including a case that supports the system (not labeled but is the top section of the UV wand 13) having a first end and a second end, a UV lamp 13 extending from the first end of the case, a quartz cover fitted over the lamp (col.2, lines 60-63). In use the quartz cover is submerged in the water within container 12 (Figure 3) and the lamp is turned on intermittently to purify the water. See col.3, lines 12-13. Although not disclosed, from the figures, it appears that the UV lamp is powered by a source through a power cord. However, one of ordinary skill in the art would have found it obvious to use a known source of electrical power, such as a battery and its associated power supply means. It is clear from the small size of the device of Karamian and the disclosure that it is easily removed, that the UV lamp can be hand-held. See col.3, lines 19-20. With respect to sensing that the lamp is immersed, this can be done by "sensing" it by simply seeing the lamp.



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As to the container being "a drinking container" (claim 11), insufficient structure has been recited that would distinguish a "drinking container" from any other type of container.

3. Claims 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Karamian in view of Snowball.

Karamian teaches a method of purifying water that is held in a container 12. The method of Karamian includes immersing an ultraviolet lamp 13 and an associated quartz cover 16 into water to be purified. The lamp is turned on intermittently to purify the water (col.3, lines 12-14). Karamian does not disclose agitating the water. However, Snowball teaches inducing agitation in water undergoing UV purification to ensure that all the water is brought into contact with the UV radiation. See col.2, lines 30-35. For this reason, it would have been obvious to induce agitation in the method of Karamian.

#### *Double Patenting*

4. Claims 2-3 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-3 of U.S. Patent No. 5,900,212. Although the conflicting claims are not identical, they are not patentably distinct from each other because although the wording of the claims differs, the subject matter being claimed is substantially the same.

5. Claims 5-6 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 4, 5, and 7 of U.S. Patent No. 5,900,212. Although

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the conflicting claims are not identical, they are not patentably distinct from each other because although the wording of the claims differs, the subject matter being claimed is substantially the same.

6. Claims 8-10 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 9 and 10 of U.S. Patent No. 5,900,212. Although the conflicting claims are not identical, they are not patentably distinct from each other because although the wording of the claims differs, the subject matter being claimed is substantially the same.

7. Claims 12 and 13 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 2 of U.S. Patent No. 5,900,212. Although the conflicting claims are not identical, they are not patentably distinct from each other because although the wording of the claims differs, the subject matter being claimed is substantially the same.

*Allowable Subject Matter*

8. Claims 14, 15, 17, and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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*Response to Arguments*

9. Applicant's arguments filed June 23, 1999 have been fully considered but they are not persuasive.

10. Applicant argues that Karamian does not render obvious the present invention because "the system described in the '256 patent does not initially sterilize, or purify, the fluid, and there is no teaching or suggestion that the system would allow unsterilized fluid into the system and/or that the system could purify the unsterile fluid with the UV light source."

In response, the Examiner first notes that the above arguments are moot with respect to the apparatus claims. The manner or method in which a machine is to be utilized is not germane to the issue of patentability of the machine itself. *In re Casey*, 152 USPQ 235. Moreover, a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647.

The arguments are germane to the method claims but it is noted that these claims *do not require* purification of "unsterilized fluid" as argued by applicant. However, if applicant were to amend the claims to include this limitation, Karamian would be combined with other art of record showing that it is convention to use UV radiation to purify unsterilized fluid. Note that Karamian teaches that the lamp "can be adapted for use in any system where it is necessary or desirable to prevent bacterial contamination from an outside source." See col.3, lines 24-27.

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11 It is further argued by applicant that there is "no teaching or suggestion in the '256 patent that the UV lamp could be hand-held, particularly since the placement of the lamp in the fluid path relative to the associated stopcock is *the essential feature* of the system". However, the ability to be hand-held only requires that the lamp be *of a size capable* of being hand-held, *not* that the lamp is being hand-held at the time of sterilization. Note that Karamian teaches that the lamp is "of small size that can be easily removed and replaced if necessary." See col.3, lines 19-20.

#### *Declaration*

12. The Declarations of Miles Maiden and Anne Hanson have been considered but are deemed inadequate to overcome the rejections under 35 U.S.C. 103, as set forth *supra*.

#### *Conclusion*

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leigh McKane, whose telephone number is (703) 305-3387. The examiner can normally be reached on Monday-Thursday from 7:30 AM-5:00 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Robert Warden, can be reached at (703) 308-2920. The Unofficial fax phone number for this Group is (703) 305-7719. The Official fax phone number for this Group is (703) 305-3599.

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Page 7

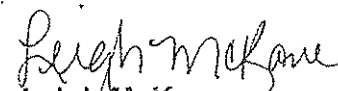
Art Unit: 1744

When filing a FAX in Technology Center 1700, please indicate in the Header (upper right) "Official" for papers that are to be entered into the file, and "Unofficial" for draft documents and other communications with the PTO that are not for entry into the file of the application. This will expedite processing of your papers.

Communications via Internet e-mail regarding this application, other than those under 35 U.S.C. 132 or which otherwise require a signature, may be used by the applicant and should be addressed to [robert.warden@uspto.gov]. All Internet e-mail communications will be made of record in the application file. PTO employees will not communicate with applicant via Internet e-mail where sensitive data will be exchanged or where there exists a possibility that sensitive data could be identified unless there is of record an express waiver of the confidentiality requirements under 35 U.S.C. 122 by the applicant. See the Interim Internet Usage Policy published by the Patent and Trademark Office Official Gazette on February 25, 1997 at 1195 OG 89.

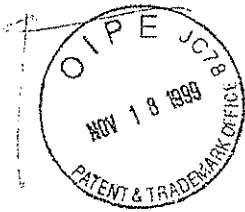
Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist, whose telephone number is (703) 308-0661.

August 2, 1999

  
Leigh McKane  
Primary Examiner  
Art Unit 1744

PAGE 1 OF 1

|  |   |  |                        |                         |                           |                            |                |
|--|---|--|------------------------|-------------------------|---------------------------|----------------------------|----------------|
| FORM PTO-892   |   | U.S. DEPARTMENT OF COMMERCE<br>PATENT AND TRADEMARK OFFICE |                        | SERIAL NO.<br>09/256054 | GROUP ART<br>UNIT<br>1744 | ATTACHMENT<br>TO PAPER NO. | 5              |
| NOTICE OF REFERENCES CITED   |   |  |                        | APPLICANT(S)<br>MAIDEN  |                           |                            |                |
| U.S. PATENT DOCUMENTS  |   |  |                        |                         |                           |                            |                |
| *  |   | DOCUMENT NO.   | DATE                   | NAME                    | CLASS                     | SUB-<br>CLASS              | FILING<br>DATE |
|  | A | 5,900,212  | 5/1999                 | Maiden et al            | 422                       | 24                         |                |
|  | B |  |                        |                         |                           |                            |                |
|  | C |  |                        |                         |                           |                            |                |
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| OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, Etc.)  |   |  |                        |                         |                           |                            |                |
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| EXAMINER<br>Leigh McKane   |   |  | DATE<br>August 2, 1999 |                         | Form 892ccs2105b          |                            |                |
| * A copy of this reference is not being furnished with this office action.<br>(See Manual of Patent Examining Procedure, section 707.05(a).) |   |  |                        |                         |                           |                            |                |



*D. Hawerice*  
*#9K*  
 PATENTS  
 108030-0691C *11/30/99*

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re The Application of: )  
 Miles Maiden et al. )  
 Serial No.: 09/256,054 )  
 Filed: February 23, 1999 )  
 For: HAND-HELD ULTRAVIOLET )  
 WATER PURIFICATION SYS- )  
 TEM )

Examiner: McKane

Art Unit: 1744

Cesari and McKenna, LLP  
 30 Rowes Wharf  
 Boston, MA 02110  
 November 18, 1999

Honorable Assistant Commissioner for Patents  
 Washington, D.C. 20231

Sir:

AMENDMENT

In response to the Office Action dated August 3, 1999, please cancel claim 1,  
 amend claims ~~2, 3, 5, 7-14~~, and ~~16-19~~ and add new claims 20-28 as follows:

AMENDED CLAIMS

- C1*
- 17/* 2. The system of claim *16* [1] ~~20~~ further including a liquid-level sensor that prevents the  
 [lamp] light source from turning on until the [lamp] light source is immersed in water.
- 18/* 3. The system of claim *17* [2] further including a timing circuit that turns the [lamp] light  
source off a predetermined time after the sensor turns the [lamp] light source on.

- C2* *Sub E1* 5. A method of purifying a batch of unsterilized water that is held in a container, the  
 method including the steps of:

11/23/1999 HADAWI

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 04 FC:203

78.00 DP  
 63.00 DP

*12*

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PATENTS  
108030-0001C1

- LC
- A. turning a hand-held water purification system on;
  - B. immersing an ultraviolet [lamp] light source and associated ultraviolet transmissive cover that extend from a first end of the system in the batch of unsterilized water [to be purified];
  - C. sensing that the [lamp] light source is immersed fully in the unsterilized water; [and]
  - D. turning the [lamp] light source on to emit ultraviolet radiation in the batch of unsterilized water in the container, the radiation purifying the water.

C3 3. The method of claim 1 further including the step of turning the [lamp] light source off a predetermined time after the [lamp] light source is turned on.

4. A method of purifying water that is held in a container, the method including the steps of:

- C4
- A. immersing an ultraviolet [lamp] light source and an associated ultraviolet transmissive cover that form one end of a water purification system in the water to be purified;
  - B. turning the [lamp] light source on to emit ultraviolet radiation in the water; and
  - C. agitating the water by stirring the water with the [lamp] light source and cover end of the system, the radiation from the [lamp] light source purifying the water.

C5 5. The method of claim 4 further including the step of sensing that the [lamp] light source is immersed fully in the water before turning on the [lamp] light source.

C6 6. The method of claim 4 further including the step of turning the [lamp] light source off a predetermined time after the [lamp] light source is turned on.



PATENTS  
108030-0001C1

7. A hand-held system for purifying unsterilized water, the system including:

- A. a drinking container having at one end an opening through which water both enters and exits the container and a second closed end for holding the water in the container;
- B. a case with an outwardly extending ultraviolet [lamp] light source, the [lamp] light source for submerging [submersion] in the unsterilized water that is held in the drinking container [to provide] and providing ultraviolet emissions that purify the unsterilized water,
- C. [an ultraviolet transmissive cover that fits over the ultraviolet lamp and connects to the case to protect the lamp from the water; and] control means for turning [on] the [lamp] light source on and off, the control means being contained in the case.

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8. The system of claim 7 further including a liquid-level sensor that prevents the [lamp] light source from turning on until the [lamp] light source is immersed in water.

9. The system of claim 8 further including a timing circuit that turns the [lamp] light source off a predetermined time after the sensor allows the [lamp] light source to turn on.

10. The system of claim 8 wherein the means for turning on the [lamp] light source includes a battery.

Sub D1  
16. A method of purifying water that is held in a container, the method including the steps of:

- A. immersing an ultraviolet [lamp] light source and an associated quartz cover that form one end of a water purification system in the water to be purified;

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- B. turning the [lamp] light source on to emit ultraviolet radiation in the water to purify the water; and
- C. agitating the water to expose all of the water in the container to the ultraviolet radiation.

<sup>13</sup>17. The method of claim <sup>12</sup>~~16~~ further including the step of sensing that the [lamp] light source is immersed fully in the water before turning on the [lamp] light source.

<sup>14</sup>18. The method of claim <sup>12</sup>~~16~~ further including the step of turning the [lamp] light source off a predetermined time after the [lamp] light source is turned on.

<sup>15</sup>19. The method of claim <sup>12</sup>~~16~~ wherein the step of agitating the water includes agitating the water with the immersed ultraviolet [lamp] light source.

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NEW CLAIMS

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<sup>16</sup>20. A hand-held water purification system for purifying unsterilized water in batches, the system including:

- A. an ultraviolet light source;
- B. an ultraviolet transmissive cover that fits over the light source;
- C. power means for supplying power to the light source; and
- D. a case that contains the power means and connects to the ultraviolet transmissive cover to form a water-tight enclosure for the ultraviolet light and the power means.

<sup>20</sup>21. The system of claim <sup>16</sup>~~20~~ wherein the power means includes a battery and an associated ballast circuit.

<sup>21</sup>22. The system of claim <sup>16</sup>~~20~~ wherein the case includes

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- a. a first section and a second section that separate to provide access to the power means, and
- b. sealing means for making a water-tight seal between the first and second sections.

~~22~~ 23. The system of claim ~~22~~ <sup>21</sup> wherein the sealing means is a gasket.

~~23~~ 24. The system of claim ~~23~~ <sup>16</sup> further including in the case a control means for switching the ultraviolet light source on to purify a batch of unsterilized water and thereafter switching the light source off.

~~24~~ 25. A hand-held system for purifying unsterilized water, the system including:

- A. a case with an outwardly extending ultraviolet light source, the light source for submerging in the unsterilized water and providing ultraviolet emissions that purify the unsterilized water,
- B. control means for turning the light source on and off, the control means being contained in the case.
- C. an ultraviolet transmissive cover that fits over the ultraviolet lamp and connects to the case in a water-tight manner to protect the lamp and the control means from the water.

~~25~~ 26. The system of claim ~~25~~ <sup>24</sup> wherein the control means includes

- a. a switch; and
- b. a timer for operating the switch to turn the light source off a predetermined time after the light source turns on.

~~26~~ 27. A method of purifying a batch of unsterilized water that is held in a container, the method including the steps of:

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- A. immersing an ultraviolet light source and an associated ultraviolet transmissive cover that form one end of a water purification system in the batch of unsterilized water that is held in the container;
- B. turning the light source on to emit ultraviolet radiation in the batch of unsterilized water in order to sterilize the water;
- C. turning the light source off; and
- D. removing the light source from the batch of water held in the container.

27  
28. The method of claim 27 wherein the step of turning the light source off further includes turning the light source off a predetermined time after turning the light source on.

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REMARKS

We thank the Examiner for the recent interview and discussion of the pending claims and the cited prior art. We have carefully considered the Office Action dated August 3, 1999 and in response to the Office Action and the interview, we have canceled claim 1 and replaced it with new claim 20, added new claims 21 - 28 and amended claims 5 and 11 as set forth above. We have also amended various other claims for consistency purposes. As discussed in the interview, we are filing herewith a terminal disclaimer to overcome the double patenting rejection.

Claims 5 and 11 are amended to more particularly point out that the ultraviolet light source of the current system is immersed in a batch of unsterilized water and turned on to sterilize the batch of water. This is in contrast to the system discussed in the Karamian patent, in which the water in the system is sterilized *before* it enters the system. The lamp in the Karamian system is thus not used to sterilize a batch of unsterilized water. Further, there is no teaching or suggestion of using the lamp in the Karamian system in such a manner. Accordingly, the Karamian patent does not teach

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or suggest the invention of amended claims 5 and 11, the claims that depend therefrom, or new claims 27 and 28.

Claim 20 replaces claim 1 and more particularly points out that a case that encloses both the ultraviolet light source and the associated power means protects both from the water. In contrast, the Karamian system includes an apparatus 12 that is shaped specifically to hold one end of the lamp in the path of the sterile water, and the other end of the lamp out of the path of the water. The end of the lamp that is held out of the path of the water is the one that, through a cord indicated in the drawings, connects the lamp to whatever circuitry provides power to the lamp. With this connection end of the lamp and the power circuitry held out of the water, there is no teaching or suggestion to include in the Karamian system a case that assembles in a water-tight manner to protect the lamp, the power circuitry and any interconnections from the water. Accordingly, the Karamian patent does not teach or suggest the system of claim 20 and the claims that depend therefrom. Further, there is no teaching or suggestion in the Karamian patent of a case that protects from the water both the lamp and the control circuitry that turns the lamp on and off, as set forth in new claim 25 and the claims that depend therefrom.

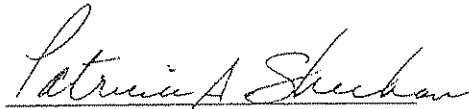
The claims as amended should now be in form for allowance. We request that the Examiner reconsider her rejections and issue a Notice of Allowance for all pending claims.



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Respectfully submitted,



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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re The Application of:  
Miles Maiden et al.

Serial No.: 09/256,054

Filed: February 23, 1999

For: HAND-HELD ULTRAVIOLET  
WATER PURIFICATION SYSTEM

Examiner: McKane

Art Unit: 1744

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Honorable Commissioner of Patents and Trademarks  
Washington, D.C. 20231

Sir:

TERMINAL DISCLAIMER UNDER 37 C.F.R. §1.321(b)

I, Miles Maiden, represent that I am a representative authorized to sign on behalf of the assignee identified below owning all of the interest in above-identified application.

The Assignee of this application is Hydro-Photon, Inc. (the "Assignee"), whose business address is P.O. Box 675, Route 172, Blue Hill, ME 04614. I am employed by the Assignee as President, and am empowered to act on behalf of the Assignee.

The assignment of this application was recorded on February 18, 1998, on Reel 8973, Frames 0731. The extent of the Assignee's interest is in the whole of the invention. The undersigned has reviewed all documents in the chain of title of the above-identified application, and to the best of the knowledge and belief of the undersigned, title is in the Assignee.

On behalf of the Assignee, I hereby disclaim the terminal part of any patent granted on the above-identified application which would extend beyond the expiration date of the full statutory term of United States Patent No. 5,900,212, as presently shortened by any terminal disclaimer, and hereby agree that any patent so granted on the above-identified application shall be enforceable only for and during such period that the legal title to said patent shall be the same as the legal title to United States Patent No. 5,900,212, this agreement to run with any patent granted on the above-identified application and to be binding upon the grantor, its successors or assigns.

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The Assignee does not disclaim any terminal part of any patent granted on the above-identified application prior to the expiration date of the full statutory term of United States Patent No. 5,900,212, as presently shortened by any terminal disclaimer, in the event that it later: expires for failure to pay a maintenance fee; is held unenforceable, is found invalid, is statutorily disclaimed in whole or terminally disclaimed under 37 C.F.R. §1.321(a); has all claims cancelled by a reexamination certificate, or is otherwise terminated prior to expiration of its statutory term as presently shortened by any terminal disclaimer, except for the separation of legal title stated above.

I hereby declare that all statements made herein of my own knowledge are true, and that all statements made on information and belief are believed to be true; and further, that these statements are made with the knowledge that willful false statements, and the like so made, are punishable by fine or imprisonment, or both, under Section 1001, Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

HYDRO-PHOTON, INC.

November 16, 1999  
Date  
  
Miles Maiden  
President